## REMARKS

A petition for a three month extension of time and an Notice of Appeal have today been filed as separate papers and copies are attached hereto.

The Rejection of Claims 1-31 , First Paragraph, 35 USC 112

In any scope of enablement rejection, the initial burden is, by law, on the examiner to support such a rejection by a showing of "acceptable evidence or reasoning" as to why one of ordinary skill in the art would not be able to practice the invention as broadly as claimed. In re Mayhew, 179 USPQ 42 (CCPA 1973). Here the only "reasoning" advanced by the examiner is the statement: "This is based upon applicants argument regarding the difficulties in making a device with the claimed characteristics." It is respectfully submitted that the quoted statement fails to support (establish) a prima facie case for lack of enablement for several reasons. Firstly, the statement is a non sequitur because the acknowledged existence of difficulties faced by the prior art, which difficulties were addressed and overcome by the applicants, has no relevance to an issue of whether or not the specification is enabling for the claimed subject matter. Secondly, the examiner does not identify the "argument" upon which he relies and, as a consequence the applicants and their agents and attorneys can only guess as to what might be the Examiner's rationale.

However, the issue may be moot in view of the present amendments to claim 1. The examiner will note that the present amendments incorporate the limitations of all of canceled claims 4, 5 and 7 into claim 1. If the "argument" to which the examiner refers is that at the bottom of page 9 of applicants' previous response, the issue should now be moot in that applicants' only independent claim (claim 1) has now been limited to specifics with regard to the nature of the resin particles and to a specific range for thickness of the light diffusion layer.

The Prior Art Rejections in General

The examiner presents essentially the same argument for all four prior art rejections. Firstly the examiner states that "the diffuser properties listed are simply those which everyone tries to optimize." It is respectfully submitted that the examiner's characterization of applicants' is incorrect. Applicants' claims do not merely list desirable properties. On the contrary, applicants' claims recite ranges for a number of properties as a combination which the prior art failed to provide and, indeed, gives no clue how to achieve. For example, the Ohnuma declaration presented with the previous response reports the results of experiments replicating the working examples of Konno et al and graphs those results. The graph clearly shows that as the haze percentage goes up the percentage for distinctness of image goes down, with the result that a percentage of at least 80% for haze and not be provided simultaneous (in the same product) with a percentage of at least 25% for distinctness of transmission image. The two properties offset when one follows the teachings of Konno in a manner that the ranges therefor recited by applicants' claim 1 can never be simultaneously satisfied.

Even if the examiner were correct in characterizing "distinctness of image", "haze", and "total light transmission" as properties "which everyone tries to optimize", it would not logically follow that the combination of the ranges therefor recited by applicants' claim 1 should be regarded as obvious over the prior art.

The examiner also errs where he writes:

> Konno evidences this [what ?] with discussion of luminance and visibility two alternative descriptions of the same characteristics (col. 5, lines 16-65).

Konno does not use the terms "luminance" and "visibility": as "two alternative descriptions of the same characteristics." At column 5, lines 16-65, cited by the examiner, it can be seen that

"luminance" and "visibility" are determined by Konno using different apparatus and are rated according to different standards. As taught by Konno at column 3, lines 1-12, what Konno regards as "luminance" is a function of the weight ratio of the polymer particles to the polymer binder. As further taught at column 3, lines 13-21 of Konno, the "viewing nature or visibility" is a function of the optical diffusion power capability for hiding dots of a light guiding plate. As konno further describes there, a matting agent is added "in order to improve the visibility."

<u>The Rejection of Claims 1-7, 13-15, 21-24, and 27-29 for Obviousness over Maekawa in view of Konno, Etori and Mizobata</u>

Here, the examiner fails to state a prima facie case of obviousness for the reasons that (1) he fails completely to explain how is combining the references and what teachings therein he is relying upon to meet the various limitations of applicants' claims and (2) he gives no rationale why one skilled in the art would have been motivated to combine the teachings of these references in any manner.

Etori et al at column 1 discuss the differences between <u>reflection type</u> LCDs and <u>transmission type</u> LCDs. Briefly, as taught by Etori, the transmission type LCD has higher contrast and a lighter display than a reflection type LCD but, because the reflection type LCD has no back light unit, the reflection type LCD can be made thinner and lighter consumes less power (column 1, lines 13-19). The Etori and Mizobata patents disclose inventions directed to a <u>front</u> light scattering film or plate of a <u>reflection type</u> LCD. See, for example, column 1, lines 6-10 of Etori and light scattering glass plate 14 of Mizobata. Note that these elements present the viewing surface of the reflection type LCDs of Etori and Mizobata. The LCDs of Etori and Mizobata have no back light unit and, therefore, have no light diffusion sheet in a back light unit. In point of fact, a reflection type LCD includes no

element corresponding to a light diffusion sheet.

On the other hand Konno and Maekawa relate to transmission type LCDs having back light units. However, Konno and Maekawa relate to very different elements of a transmission type LCD. Maekawa relates to an anti-glare film for the front viewing surface of the LCD unit and is not a component of the back light unit. See column 1 , lines 4-9 of Maekawa. Thus, Maekawa relates to anti-glare display surfaces such as represented by anti-reflection films 11 on plate 4 of Satoh. Note in Satoh the distinction between the function of films 11 and that of the diffusion plate of the back light device 3 (see column 3, lines 44- 48 of Satoh). Also refer to Figure 6 of Konno which shows a "diffusing plate 13" of a back light unit.

Thus, in this first rejection the examiner is somehow modifying the anti-glare film on the display surface of the transmission type LCD of Maekawa in view of teachings of secondary references relating to reflection type LCDs (Etori and Mizobata) and teachings directed to a light diffusing sheet of a back light unit of a transmission type LCD. In other words, none of the three secondary references relates to the structure of Maekawa which the examiner would somehow modify without any motivation whatsoever.

Further, light diffusion is undesirable in an antiglare element. Accordingly, modification of the anti-glare film of Maekawa to convert it to a light diffusing element for a back light unit or otherwise completely emasculates the teachings of Maekawa. Those skilled in the art would consider any attempt to combine a light diffusing element with an anti-glare film to be nonsensical.

Whereas claim 1 here recites a mean particle diameter of 16 - 30 microns, Maekawa teaches different particles with different diameter ranges, i.e.a particle diameter of 0.1-0.2 micron (column 3, lines 23-25), 1.0-1.5 microns (column 3, lines 26-28), and 2-10 microns (column 3, lines 6-10). None of the ranges falls within or overlaps the range of claim 1 here and there is no teaching of a mean diameter for all such particles.. Whereas claim 1 here recites a thickness for the light diffusion layer of 25-50 microns, the thickness of antiglaring film 1 of Maekawa is calculated to be less than 15 microns, based on application of the coating liquid in the amount of 3-15 $g/m^2$ (column 7, lines 18-25). These differences reflect the differences in intended use. It is submitted that it would not have been obvious to modify Maekawa in a manner inconsistent with its intended use, e.g. to render it suitable for use as a back light diffuser, a use Maekawa in no way contemplates. In other words, it would not have been obvious to change the basic character of the anti-reflection film of Maekawa.

<u>The Rejection of Claims 1-31 for Obviousness Over Satoh, in view of Konno, Etori and Mizobata</u>

Satoh is directed to improvements in an anti-reflection film for the outside viewing surface of a transmission type LCD. In Satoh the back light is scattered by a different element not shown but described as part of "backlight device 3" (column 3, lines 44-49). As noted above, Etori and Mizobata relate to anti-glare display surfaces of reflection type LCDs. On the other hand, Konno, is directed to an element for diffusing back light in a transmission type LCD. Again, a rejection is based on teachings relating to differing structures having different functions combined without regard for those differences and without regard for need of motivation for a <u>prima facie</u> proper reference combination.

Further, as noted above, light diffusion is undesirable in an antiglare element. Accordingly, modification of the anti-glare film of Satoh to convert it to a light diffusing element for a back light unit or otherwise completely emasculates the teachings of Satoh. Again, those skilled in the art would consider any attempt to combine a light diffusing element with an anti-glare film to be nonsensical.

Whereas claim 1 here recites a mean particle diameter of 16 - 30 microns, Satoh teaches a particle diameter of 0.085 micron (85 nm - column 4, lines 19 and 20). Whereas claim 1 here recites a thickness for the light diffusion layer of 25-50 microns, Satoh teaches a range in the thickness of 0.1-0.2 micron (100-200 nm - column 7, lines 41-47). These differences reflect the differences in intended use. It is submitted that it would not have been obvious to modify Satoh in a manner inconsistent with its intended use, e.g. to render it suitable for use as a back light diffuser, a use Satoh in no way contemplates. In other words, it would not have been obvious to change the basic character of the anti-reflection film of Satoh.

<u>The Rejection of Claims 1-31 for Obviousness Over Toshima in view of Konno, Etori and Mizobata</u>

As explained by Toshima (not "Takashima") at column 2, lines 25-36, their invention depends to a large extent on the surface "undulation" to produce the desired degree of diffusion. That undulation is produced by Toshima by having "at least a part of the light diffusive agent protrude from the surface of the light diffusion layer," quoting from column 2, lines 32-34. Toshima further teaches at column 2, lines 34-36: "As a result, only a small amount of the light diffusive agent can improve the light diffusability and, therefore, enhance the light transmittance." Thus, the invention

of Toshima seeks to reduce the amount of light diffusive agent. As taught at column 4, line 62 to column 5, line4 of Toshima, the light diffusive agent particles are 100% by weight or less, based on the weight of the resin, preferably 50% by weight. Compare claims 21 here. Thus, the parameters taught by Toshima in terms of percentage of light diffusing particles in the resin binder are far removed from what applicants teach to be those ranges for such parameters necessary to achieve values for both haze and distinctness of transmission image as claimed here. Indeed, Toshima discloses any values for haze.

Toshima is directed to improvements in a diffusive sheet designed to be used in a back light unit of a transmission type LCD. As noted above, Etori and Mizobata relate to anti-glare display surfaces of reflection type LCDs for which light diffusion is undesirable and, therefore, their combination with Toshima is considered to be nonsensical. On the other hand, the combination with Konno is considered improper because the amount of particles contained in the binder is quite different between the two references. Konno allegedly obtain an improved optical diffuser by employing a specific range for weight ratio of the particles to the binder, i.e. 1.9 to 2.6 (see abstract) whereas Toshima provides an optical film of high light transmittance by using a small amount, 50% or less, of the light diffusive agent . Thus Toshima and Konno are based on completely different concepts and should not be combined.

<u>The Rejection of Claims 1-31 for Obviousness over Yano in view of Konno, Etori and Mizobata</u>

The light diffuser of Yano attains diffusion by providing a plurality of differing layers and controls the extent of diffusion by varying the number os such layers. As such, Yano's light diffuser is designed based on an entirely different concept that of Konno. In contradistinction, Konno varies

diffusion by suitably changing the ratio of particles 4a (completely buried in the synthetic resin) and particles 4b (partially buried in the synthetic resin), as taught at column 3, lines 49-63. Thus, the concepts and structures of Konno and Yano are very different and , for this reason, one skilled in the art would not have been motivated to combine their teachings. As noted above, Etori and Mizobata relate to anti-glare elements for which light diffusion is undesirable and, further, because they relate to display surfaces of reflection type LCDs, their combination with Yano is considered to be improper, even nonsensical.

Also attached hereto are pages from the web site of the assignee of this application which illustrate the structure of a transmission type LCD and a copy of comments by the inventors. The examiner is respectfully requested to review these materials in the course of reconsideration of the rejections of record.

Respectfully submitted,

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Dated: February 19, 2004

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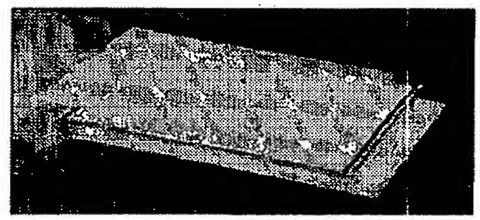
# Diffusion Film - Light Up

Specialty Functional Film

## Diffusion Film - Light Up

Light Up is a series of diffusion films for use in LCD backlit units. The most important roles of diffusion films are to produce even brightness all over the display and to re-direct as much light as possible towards the viewer. Multi layered diffusion films often make the monitor brighter. Light Up's antistatic treatment prevents dust from attaching to the film during use.



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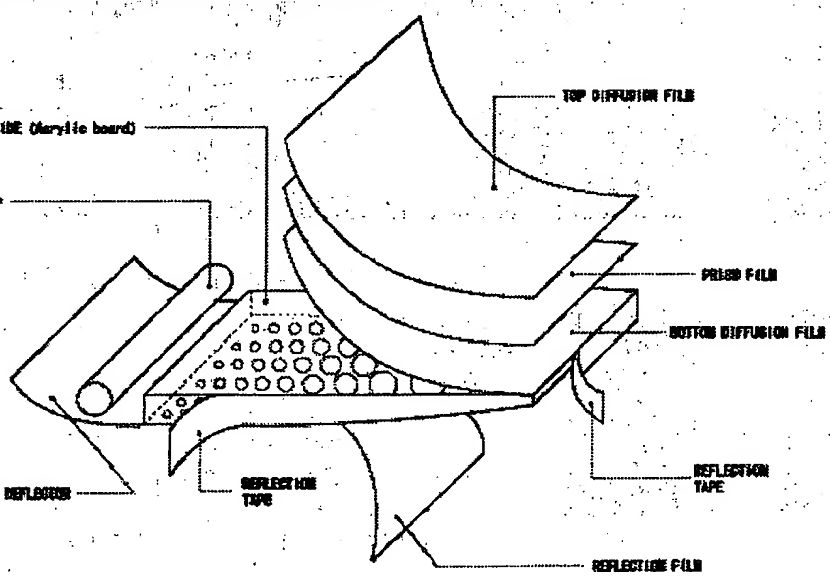
## Structure of an Edge Light Backlit Unit

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## Characteristics of Diffusion Films

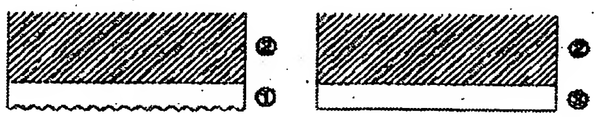
Structure

- 75PBA
- 100PBU

- S ● SXE ● MXE ● LSE
- GM2 ● GM3 ● TL2 ● TL4


①

①
1.Diffusion layer




2.Film Base
3.Back Coat

**Technical data**

| | Type | Total thickness (microns) | Haze | Total light transmittance |
|---|---|---|---|---|
| | 75PBA | 100 | 89.5% | 87.0% |
| | 100PBU | 125 | 89.5% | 66.0% |
| | 100S | 110 | 86.5% | 99.0% |
| | 100SXE | 115 | 89.5% | 99.0% |
| | 100MXE | 115 | 88.0% | 99.0% |
| | 100LSE | 115 | 84.0% | 98.0% |
| The Invention { | 100GM2 | 133 | 89.0% | 99.0% |
| | 100GM3 | 139 | 91.5% | 99.0% |
| Toshima → { | 100TL2 | 108 | 29.0% | 90.0% |
| | 100TL4 | 106 | 46.0% | 90.6% |

(tolerance +/-5%)

All types are antistatic treated.

Page

## Download

Not available for the moment

Page

The inventor's comments on the references

Konno

All of the examiner's rejections are based on the Konno reference. However, he does not understand this reference properly. This misunderstanding is caused by the mistranslation of the original Japanese text into the English version.

Specifically, according to the corresponding Japanese patent application Kokai No.7-174909, "[×] represents the case that the dot pattern of the light-conductive plate is clearly distinguishable, [△] represents the very limit and [○] represents the case that the dot pattern is completely undistinguishable."(column 5, lines 8-11) In Table 1, the visibility of samples No.1~No.3 is represented by ×, △, ○ respectively.

However the corresponding portion of this description in the US 5,607,764 is "An optical diffuser which gave a clearly distinguishable dot pattern was marked "AA". An optical diffuser which gave a barely distinguishable dot pattern was marked "BB". An optical diffuser which gave an undistinguishable dot pattern was marked "CC"", and the visibility of Sample No.1 is marked as CC, No.2 BB, No.3 AA.

Accordingly, the sample No.3, which gave an undistinguishable dot pattern in the Japanese version, became that gave a clearly distinguishable dot pattern in the English version. With regard to the visibility, undistinguishable dot pattern (low distinctness) is regarded as good in column 3, lines 13-17 of the Japanese text, whereas distinguishable dot pattern (high distinctness) is regarded as good in the English text.

The inventor thinks that this mistranslation misled the examiner to state "Here, the diffuser properties listed are simply those which everyone tries to optimize, low back scattering (high throughput), <u>high distinctness,</u> high haze, and are therefore obvious for that reason".

However, it is well known in the art that haze and distinctness of transmitted image have a trade-off relation. Specifically, higher haze brings lower distinctness of image. Haze has to be lowered in order to obtain higher distinctness. Since "haze is the principal function of a diffuser, so making it as high as possible is obvious based

upon the definition of a diffuser itself" as the examiner pointed out, a diffuser having a high haze cannot be asked for high distinctness.

The trade-off relation between haze and distinctness was clearly shown in the experimental results submitted in the form of Declaration in this application. Attached Figure 1 shows the relation between haze and haze for the compositions of Konno et al and the invention. As shown in the figure, in both cases, distinctness of image decreases linearly as haze increases. In comparison of distinctness at the same haze in both cases, distinctness of the invention is always higher than that of Konno et al. It is a natural course because the property required for the Konno's diffuser, "visibility", is to give undistinguishable dot pattern, i.e., low distinctness of image (I wonder why Konno et al use the term "visibility" for undistinguishable state) according to the Japanese text. This requirement is opposite to the direction of the present invention (high distinctness : "bad visibility" in their words).

As shown in Figure 1, a diffuser having haze of 80% or more and distinctness of image of 25% or more can be produced by the composition of Konno et al. However, the composition satisfying such range is limited and has a narrow range.

Figure 2 shows the relation between the total coating weight (g/m2) of the diffusing layer, which is defined in claim 1 of Konno et al, and distinctness of image and haze for Konno et al composition (a) and our composition (b). These relations were found by conducting an additional experiment. As shown in Figure 2 (a), tendencies of haze and distinctness of image markedly change between 12-14g/m2 of the total coating weight in the Konno et al composition. As the result, the total coating weight satisfying haze 80% or more and distinctness of image 25% or more falls within a range between 12.9-13.2g/m2 (gray zone in the figure). This range is very narrow compared to "10-17g/m2" recited in claim 1. In addition, since optical properties changes abruptly in this range, it is difficult to stably control the optical properties.

On the other hand, in the composition of the present invention, a total coating weight satisfying the same optical properties (gray zone) has a broad range and therefore the optical properties can be controlled easily.

By the above reasons, we believe that difference between the present invention and Konno et al should be clearly understood and the obviousness rejection based on Konno et al should be withdrawn.

Etori et al

The scattering film of Etori et al has haze of 30% or more and distinctness of transmitted image of 60% or more. These ranges overlap the claimed optical properties. However, an optical comb used for measuring the distinctness of transmitted image in the Etori et al reference is not the same as that of the present invention. Specifically, Etori et a use an optical comb having a width of 0.125mm (col.2, lines 34-41), whereas we use one having a width of 2.0mm (col.2, lines 37-43). According to the measurement method defined by JIS K 7105-1981, which is employed in both Etori et al and the invention, values using each optical comb of 2.0mm, 1.0mm, 0.5mm or 0.125mm can be obtained. Theoretically and experimentally, the lower the measurement value is, the narrower the width of the optical comb for the same sample.

Although the distinctness of image of the invention is defined as 25% or more (optical comb:2.0mm), it has an upper limit when combined with the lower limit value of haze (80%). It is estimated as approximately 50% as shown in Figure 1. If this value (50%) is expressed using the distinctness of image measured by an optical comb of 0.125mm, it is apparently lower than 50% and therefore lower than the lower limit of Etori et al. Distinctness of image was actually measured using the optical comb having a width of 0.125mm for the samples of Figure 1 and the measured values are added to Table 2, which was included in the previous experimental results. The results showed that all of the measured values were not more than 12% and that the distinctness of image defined in Etori et al is clearly different from that of the invention. The difference is resulted from difference in functions of the scattering film and the light diffusive film of the invention. Specifically, the scattering property of the scattering layer of Etori et al is brought almost by inner haze in order reduce light scattered backward. The scattering film requires higher distinctness of image than the diffusive

film. The diffusive film of the invention naturally has the upper limit, and the value is lower than the level required for the Etori's film.

Mizobata et al

We do not understand why this reference is cited by the examiner because the reflective liquid crystal display does not have a component corresponding to the diffusive film of the invention. Does the examiner regard the teaching of column 3, lines 40-42 "the scattering property itself can be easily controlled. Accordingly, an easily visible paper-white image can be obtained" relevant?

Since the element is capable of displaying a paper-white image, it must have a high light-scattering property and therefore low distinctness of image. Actually, it says "if the light scattering causing portion were formed on the transparent electrode through the intermediary of a plate having a thickness of not less than 1mm, fussiness of the displayed image becomes remarkable, and a recognition speed of legibility of a display character drops. Namely, the image quality is deteriorated". This means that the light scattering causing portion has low distinctness of image and therefore has to be positioned very close to the displayed image in order to avoid fussiness of the image. These teachings have no relation with the above-discussed relation between the light diffusion (haze) and distinctness of image.

As discussed above, all of the three references which the examiner relies upon are different from the present invention, and the present invention cannot be suggested by any combination of these references.

Maekawa et al

The anti-glaring film of Maekawa et al should not have a light-diffusive property in view of its purpose. Accordingly, even if the film has a high distinctness of image, combination of this reference with the above three is improper and non-sense.

Satoh et al

The technique of this reference is directed to prevention of reflection by a anti-reflecting layer utilizing a light interference and surface roughness. Such a technique has no relation with the present invention and combination with the above three references is improper and non-sense.

Toshima et al, Yano et al

Since these reference alone are not relevant to the present invention and the combination of the above three references upon which the examiner relies is improper, we do not think further discussion is necessary.

*Figure 1*

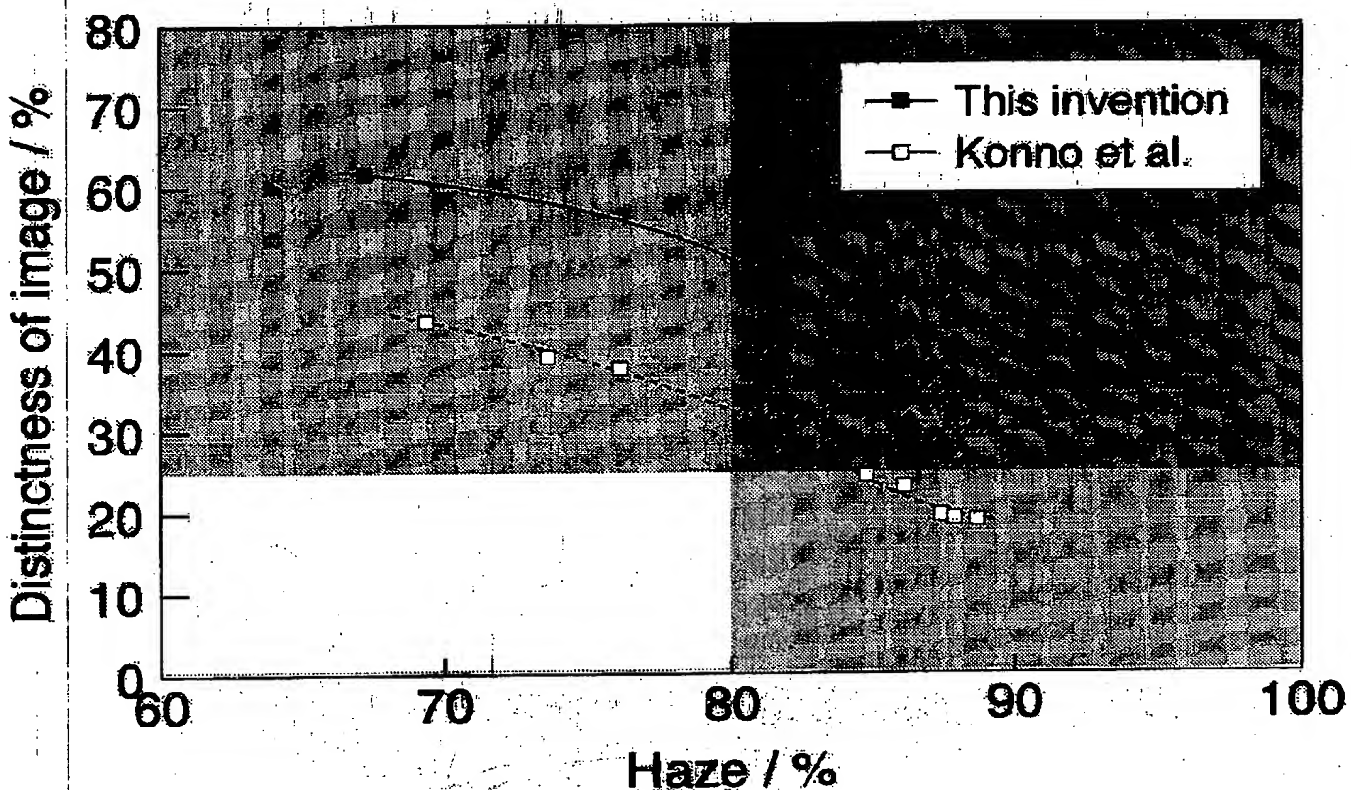

This invention
Konno et al.
Distinctness of image / %
Haze / %
0
10
20
30
40
50
60
70
80
60
70
80
90
100

Figure 2 (a)

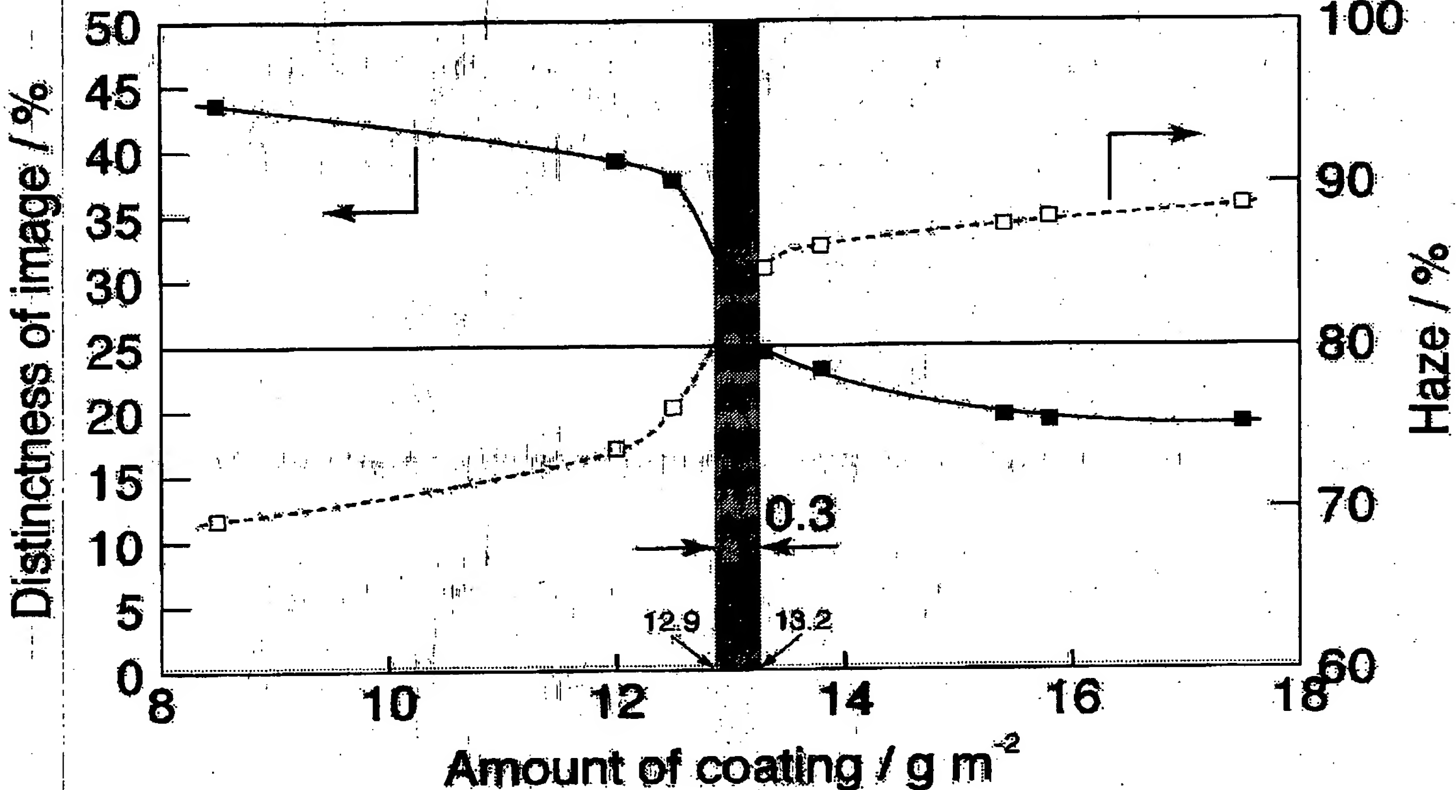

Distinctness of image / %
50
45
40
35
30
25
20
15
10
5
0
100
90
80
70
60
Haze / %
0.3
12.9
13.2
8
10
12
14
16
18
Amount of coating / g m-2

Figure 2 (b)

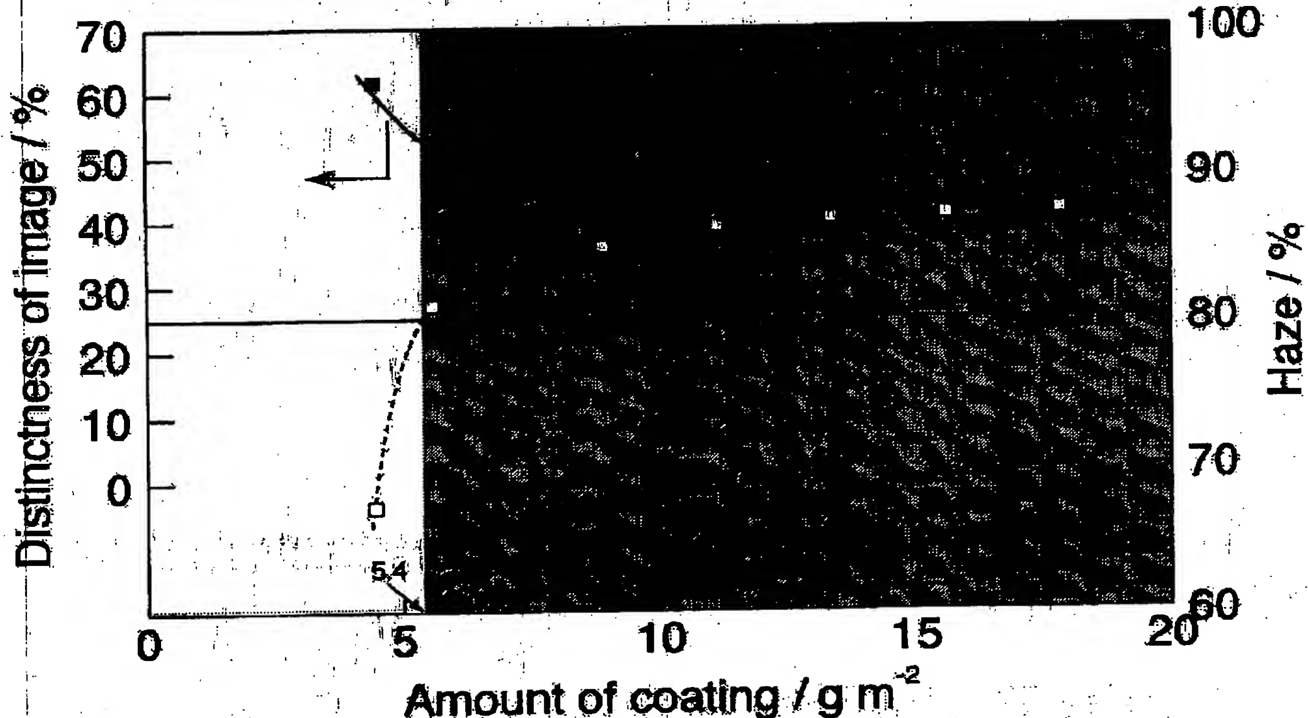

70
60
50
40
30
20
10
0
5.4
0
5
10
15
20
100
90
80
70
60
Distinctness of image / %
Haze / %
Amount of coating / g m$^{-2}$

Table 1

| Thickness of layer | Amount of coating | Distinctness of image | Haze | Total light transmittance |
|---|---|---|---|---|
| (μm) | ($g\ m^{-2}$) | $C_{(2.0)}$ (%) | (%) | (%) |
| 23 | 8.5 | 43.6 | 69.36 | 81.66 |
| 27 | 12.0 | 39.2 | 73.63 | 80.21 |
| 27 | 12.5 | 37.7 | 76.18 | 79.73 |
| 27 | 13.3 | 24.5 | 84.75 | 77.57 |
| 27 | 13.8 | 23.1 | 86.10 | 77.47 |
| 27 | 15.4 | 19.6 | 87.40 | 76.76 |
| 27 | 15.8 | 19.2 | 87.87 | 76.29 |
| 28 | 17.5 | 19.0 | 88.68 | 76.07 |

Table 2

| Thickness of layer | Amount of coating | Distinctness of image | Haze | Total light transmittance | Distinctness of image |
|---|---|---|---|---|---|
| (μm) | ($g\ m^{-2}$) | $C_{(2.0)}$ (%) | (%) | (%) | $C_{(0.125)}$ (%) |
| 25 | 4.5 | 61.7 | 67.20 | 80.73 | 12.4 |
| 27 | 5.6 | 49.1 | 80.88 | 76.01 | 11.7 |
| 30 | 8.9 | 36.7 | 84.94 | 73.99 | 8.0 |
| 32 | 11.2 | 28.5 | 86.36 | 73.28 | 7.4 |
| 35 | 13.4 | 27.2 | 86.89 | 74.19 | 6.8 |
| 37 | 15.6 | 27.4 | 87.16 | 74.54 | 6.5 |
| 39 | 17.8 | 27.2 | 87.43 | 74.61 | 6.2 |